

CONTENT

	Page
Contributors	v
Preface	vii
I History and Origin of Corn	
I Early History of Corn and Theories as to Its Origin	1
II Cytogenetic Aspects of the Origin and Evolutionary History of Corn	16
References	57
II Vegetative Morphology	
I Development of the Caryopsis	63
II Histology of the Vegetative Plant Body	75
References	87
III Structure and Development of Reproductive Organs	
I Introduction	89
II The Spikelet and Flower	89
III The Inflorescences	90
IV Development of Flower and Inflorescence	97
V Gametophytes and Fertilization	103
VI Other Maydeae	105
VII Floral Abnormalities in Corn	110
VIII Anomalous Ears	115
References	119
IV The Cytogenetics of Maize	
I Introduction	123
II Chromosome Morphology	124
III Polyploidy	131
IV B Chromosomes	138
V Meiosis in Maize	139
VI Crossing Over in Maize	147
VII Translocations	169
VIII Inversions	183
IX Deficiencies	192
X Ring Chromosomes	195
XI Abnormal Chromosome 10	197
XII Mutation	201
References	212
V Corn Breeding	
I Introduction	221
II Mass Selection	221
III Varietal Hybridization	225
IV Ear-to-Row Selection	228
V Selection within and among Inbred Lines	233
VI Evaluation of Inbred Lines	245
VII The Prediction of Double-Cross Performance	251
VIII Multiple Hybrids and Synthetics	254
IX Recurrent Selection	257
X Types of Gene Action	263
XI Cytoplasmic Sterility	269

XII	Insect Resistance	272
XIII	Disease Resistance	275
XIV	Chemical composition	279
XV	Conclusion	282
	References	283
VI	Mineral Nutrition of Corn	
I	Introduction	293
II	Growth and Development of the corn Plant	294
III	Percentage Composition of the Tissues	294
IV	Accumulation by the Whole Plant	298
V	Mineral accumulation in Corn Leaves	301
VI	Summary	312
	References	313
VII	Climatic Requirement	
I	Introduction	315
II	World-Wide Corn Production and Climate	315
III	Climatic Regions of Corn Production	316
IV	Effect of Weather on Certain Periods of Plant Growth	318
V	Effect of Rainfall and Temperature on yield	325
VI	Other Weather Factors	335
VII	Concluding Remarks	338
	References	339
VIII	Corn Culture	
I	Introduction	343
II	Soil Requirements	344
III	First Preparations	345
IV	Lime and Fertilizers	349
V	Final Preparations and planting	355
VI	Intercropping	362
VII	Choice of Hybrids	364
VIII	Cultivation	365
IX	Irrigation	367
X	Harvest	360
XI	Farm Drying and Storage	372
	References	375
IX	Production of Hybrid Corn seed	
I	Seed Corn Producers and Production Practices	379
II	Seed Stock Increase	382
III	Planting and Growing seed Corn	382
IV	Detasseling Hybrid Corn Seed Fields	387
V	Seed Corn Harvest – Field and Plant Operations	393
VI	Shelling, Sizing, and Cleaning	404
VII	Sales and Distribution Methods	417
	References	418
X	Popcorn	
I	Origin	423
II	Varieties	424
III	Popping Expansion	425
IV	Inheritance of Popping Expansion	431
V	Popcorn Hybrids	433
VI	Cross Sterility	435
VII	Pop-Dent Recoveries	436
VIII	Production and Utilization	437
	References	439

XI	Sweet Corn	
	I	Introduction 441
	II	History 441
	III	uses of Sweet Corn 443
	IV	Culture 445
	V	Problems in Sweet Corn Breeding 450
	VI	Production of Sweet Corn Seed 458
	VII	Present-Day Hybrids 460
		Reference 461
XII	Diseases of Corn	
	I	Introduction 465
	II	Seed and Seedling Diseases 469
	III	Stalk and Root Rots 473
	IV	Ear Rots 482
	V	Leaf Diseases 492
	VI	Corn Smuts 515
	VII	Miscellaneous Diseases 520
		References 527
XIII	The Most Important Corn Insects	
	I	Introduction 537
	II	Research Trend 538
	III	Soil Insects 539
	IV	Insects Attacking the Leaf, Stalk, and Ear 558
	V	Lesser Recognized Groups 592
	VI	Insects in Relation to Diseases of Corn 592
	VII	Stored-Grain Insects 595
		Acknowledgment 602
		References 603
XIV	Industrial Utilization	
	I	Introduction 613
	II	Wet Milling 613
	III	Dry Milling 627
	IV	Fermentation Industries 629
		References 634
XV	The Nutritive Value of Corn	
	I	Introduction 637
	II	Corn 637
	III	Differences in Corn 638
	IV	Chemical Composition 638
	V	Moisture Content of Corn 640
	VI	The Protein Content Corn 642
	VII	Pellagra and Corn 646
	VIII	Minerals in Corn 647
	IX	Vitamins in Corn 650
	X	Correlations of Corn Nutrients 659
	XI	The Effect of Disease on Corn's Nutritive Value 661
	XII	Parts of Corn 662
	XIII	Grinding Corn 664
	XIV	Comparison with Other Grains 667
	XV	The Energy Content of Corn 668
	XVI	Corn Products Not Discussed 669
	XVII	Summary and Conclusions 670
		References 670
XVI	The World Production of Corn	
	I	Soil Fertility 683

II	Climatic Limitations	684
III	Cultural Practices	645
IV	Progress in Corn Breeding	685
	Index	689